

### Abstract

A heat exchanger utilizing active fluid transport of a heat transfer fluid has multiple discrete flow passages provided by a simple but versatile construction. The microstructured channels are replicated onto a film layer which is utilized in the fluid transfer heat exchanger. The surface structure defines the flow channels which are generally uninterrupted and highly ordered. These flow channels can take the form of linear, branching or dendritic type structures. A cover layer having favorably thermal conductive properties is provided on the structured bearing film surface. Such structured bearing film surfaces and the cover layer are thus used to define microstructure flow passages. The use of a film layer having a microstructured surface facilitates the ability to highly distribute a potential across the assembly of passages to promote active transport of a heat transfer fluid. The thermally conductive cover layer then effects heat transfer to an object, gas, or liquid in proximity with the heat exchanger.

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